

Work Order ID 67089

Page 1

Tuesday, March 08, 2011 11:05:29 AM

Item ID: D212-664-101TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 3/8/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/15/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: CL Date: 11/03/08 Tooling: _____

Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____

Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D212-664-141

Rev D

100

0.00



MORI SEIKI CNC LATHE LARGE

11.3.81

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA113
2-Turn first side as per Folio FA113
3-File down transition lines smooth.

110

0.00



QC1- Inspect dimensions to dimension sheet

11.3.81

QC

Memo

0.00

Quality Control

120

0.00



MORI SEIKI CNC LATHE LARGE

11.3.81

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA113
2-File down transition lines smooth.
3-Remove sand and plugs

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67089

Tuesday, March 08, 2011 11:05:29 AM



Page 2

Item ID: D212-664-101TRN

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Revision ID:

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Item Name: Crosstube Turning Detail

Start Date: 3/8/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/15/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC1- Inspect dimensions to dimension sheet

0.00

nd 11.3.8

1



QC

Memo

0.00

Quality Control

140

QC8- Inspect parts - second check

0.00

SAD 11/03/09

1



QC

Memo

0.00

Quality Control

150

Crosstubes Chemical Conversion

0.00

SAD 11-03-10

①



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67089

Tuesday, March 08, 2011 11:05:29 AM



Page 3

Item ID: D212-664-101TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 3/8/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/15/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

DP

11-3-10

170

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and Stock in kanban rack
Location: 46

DP

11-3-10

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

n/3/10

MF

11-03-10

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Tuesday, March 08, 2011 11:05:25 AM

Page 1

Work Order ID: 67089



Parent Item: D212-664-101TRN



Parent Item Name: Crosstube Turning Detail

Start Date: 3/8/2011

Required Date: 3/15/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec
IPP Rev B 08.04.02 removed Polish EC verified by: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D6005-128

Manufactured

No

120

Each

23.0000

1

1



Handwritten signature and date 11-3-8

Crosstube Material

Location

Loc Qty

Loc Code

LG

23

53593

4

57911

19

Handwritten signature and circled 'X'

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

8 7 6 5 4 3 2 1



Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS
6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF
D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE
SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND
MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT
HAS NOT BOTTOMED-OUT AFTER TORQUING.

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WORK ORDER
NO. 67087
CZ11/03/08

RELEASED
2009-10-29
M

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKID TUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-141	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	XTUBE ASSY (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

D

C

B

A

12 13 15
D2893-1 SUPPORT
MS21920-25 CLAMP, 2X
D3595-063-450 RUBBER CUSHION, 2X
2 PL

A4-2

A

A

14.00 (-141)
OR 13.75 (-141B)

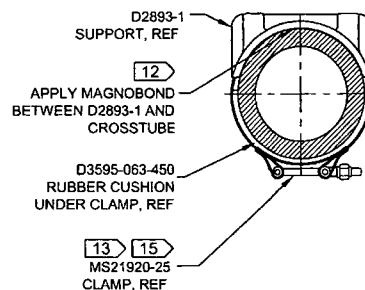


D212-664-501
BENT TUBE

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WORK ORDER
NO. 67087

CL
SYM

D212-664-141/-141B
ASSEMBLY DETAIL

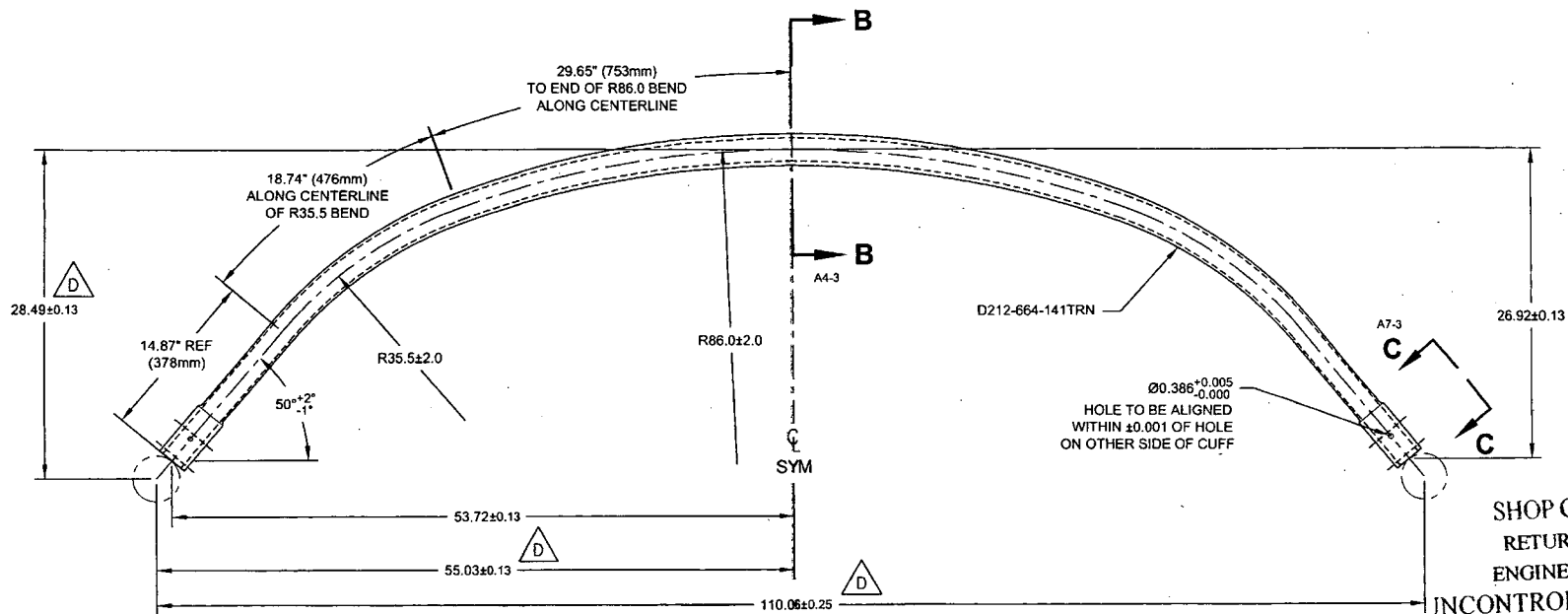


SECTION A-A
SCALE 4X D5-2

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DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	D	D212-664-141	SHEET 2 OF 4
APPROVED	14	TITLE	SCALE
DE APPR.	14	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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8 7 6 5 4 3 2 1

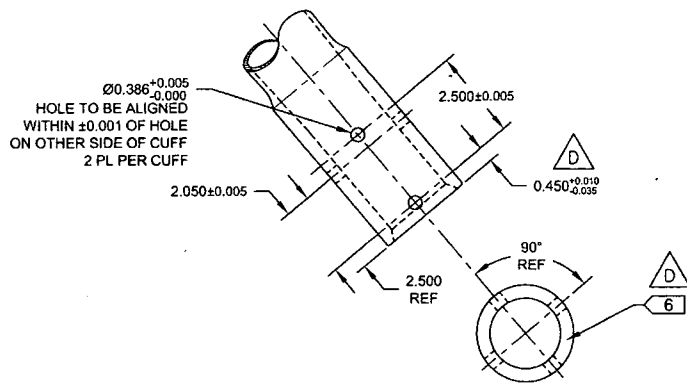


D212-664-501
BENDING AND DRILLING DETAIL

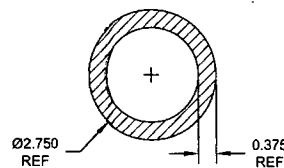


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WORK ORDER
NO. 67089

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2009-10-29
MP

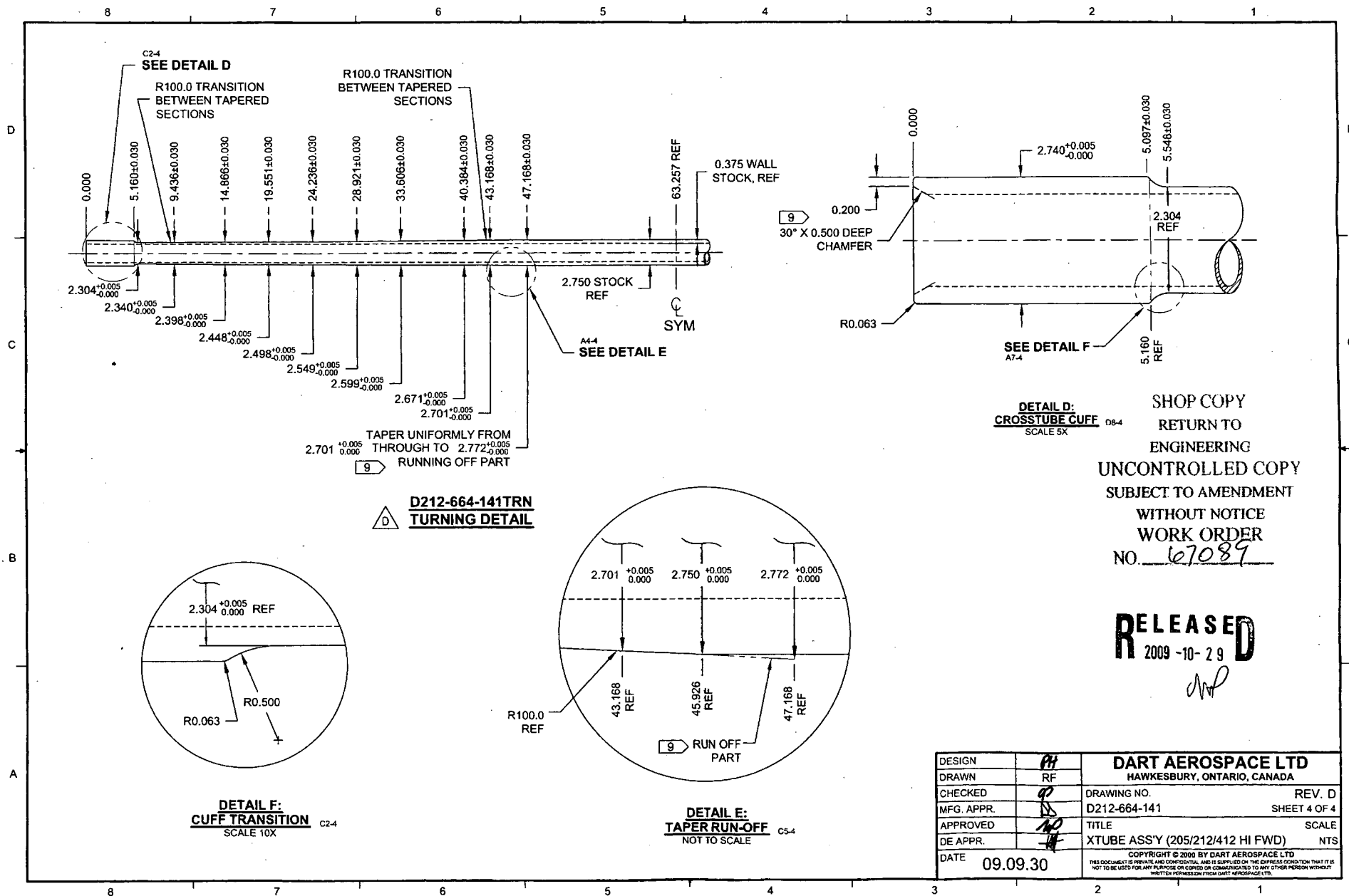


VIEW C-C: CUFF DETAIL C2-3
SCALE 3X



SECTION B-B C4-3
SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	AS	D212-664-141	SHEET 3 OF 4
APPROVED	MP	TITLE	SCALE
DE APPR.	ST	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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DART AEROSPACE LTD		Work Order:	67089
Description: Crosstube Assembly (205/212/412 High Fwd)		Part Number:	D212-664-141
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	2.00	/	20.02	
	R0.063	+/-0.010	1.063	/		
	2.740	+0.005/-0.000	2.744	/		
	5.097	+/-0.030	5.100	/		
	2.304	+0.005/-0.000	2.309	/		
	2.340	+0.005/-0.000	2.345	/		
	2.398	+0.005/-0.000	2.403	/		
	2.448	+0.005/-0.000	2.453	/		
	2.498	+0.005/-0.000	2.503	/		
	2.549	+0.005/-0.000	2.551	/		
	2.599	+0.005/-0.000	2.602	/		
	2.671	+0.005/-0.000	2.674	/		
	2.701	+0.005/-0.000	2.703	/		
SIDE B	0.200	+/-0.010	2.00	/	20.02	
	R0.063	+/-0.010	1.063	/		
	2.740	+0.005/-0.000	2.743	/		
	5.097	+/-0.030	5.100	/		
	2.304	+0.005/-0.000	2.308	/		
	2.340	+0.005/-0.000	2.345	/		
	2.398	+0.005/-0.000	2.403	/		
	2.448	+0.005/-0.000	2.452	/		
	2.498	+0.005/-0.000	2.502	/		
	2.549	+0.005/-0.000	2.553	/		
	2.599	+0.005/-0.000	2.603	/		
	2.671	+0.005/-0.000	2.674	/		
	2.701	+0.005/-0.000	2.703	/		
	126.514	+/-0.020	126.530	/	20.14	

Measured by:	<i>[Signature]</i>	Audited by:	<i>[Signature]</i>	Prototype Approval:	N/A
Date:	11.3.9	Date:	11/03/09	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-101)	KJ/JLM	
B	06.03.15	Tolerance revised for 5.097 per Dwg Rev update	KJ/JLM	
C	07.05.28	Dwg Rev updated	KJ/JLM	
D	10.02.02	Dimension 126.514 was 126.51	KJ <i>[Signature]</i>	<i>[Signature]</i>